Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

OCTOBER 1999 ◆ VOL 27 ◆ NO 10 http://safety.army.mil

Despite a long and successful tradition of work into the important relationship between safety and individual aspects of behavior and attitudes, wider organizational factors have only recently been clearly identified as contributing significantly to accident causation. This does not necessarily mean that organizational causes of accidents are a new phenomenon in Army operations; these factors have almost certainly been present since the earliest days of military operations. However, what has changed in recent years has been our thinking about the human origins of accidents. Safety culture is one such concept that explicitly addresses the wider social causes of accidents, and thus represents a significant departure from the traditional approach to safety.

Safety Is A Leader's Job

Organizational Safety Culture: Implications for Commanders

Accidents happen for a number of reasons. Some research suggests that management or supervisory inattention at all levels are the most prevalent causal category and perhaps contribute as much to accidents as the total number of operator and maintenance errors put together. This emphasizes the fact that soldiers often inherit faulty systems directly as a result of decisions made elsewhere up the chain of command. The concept of safety culture points to a number of ways of understanding and influencing, some of these factors that serve to undermine safety. Broadly defined, safety culture is the set of beliefs, norms, attitudes, roles, and social and technical practices within an organization which are concerned with minimizing the exposure of individuals to conditions considered to be dangerous. A safety culture is created as soldiers repeatedly behave in ways that seem to them to be natural, obvious, and unquestionable, and as such serve to minimize risks and dangers and increase safety.

Commander's Commitment

The first necessary condition for the development of a safety culture is that responsibility for safety should not reside purely with the soldier, but be a leadership issue as well. Effective safety programs begin at the command level with a strong emphasis on safety that flows through the entire organization. Such command commitment is essential for a number of reasons. It is important because attempts to effect enduring change are unlikely to succeed if Commanders are not seen to be closely involved and committed to the initiative. Soldiers will quickly sense where the leadership's true priorities lie and will, more often than not, try to accomplish those priorities despite explicit policy statements. This issue becomes very important when marginal decisions to go or not are required. Thus strong leadership commitment to safety is critical to support soldiers' decisions made in the face of external pressures brought about by high op-tempo. One sign to soldiers of command commitment is the perceived status within the organization of the personnel directly dealing with safety. Also, merely paying lip service for safety transgressions, rather than taking strong corrective action, can bring about a lax safety culture.

Distributed Concern

While the leadership's commitment to safety is necessary, there must be other elements in place for safe operations. The second requirement for the development of a safety culture is for concern about safety to be distributed, supported, and endorsed, by all soldiers throughout the organization. Distributed concern for safety needs to be representative of all unit soldiers. Only in this way is it possible to move toward a safe state in which

Effective safety programs begin at the command level with a strong emphasis on safety that flows through the entire organization.

...merely paying lip service for safety transgressions, rather than taking strong corrective action, can bring about a lax safety culture.

soldiers recognize the necessity and desirability of conforming to both the spirit and letter of safety rules and regulations. Under such circumstances all soldiers regard the reduction of risk as a personal as well as a unit goal. Toward this end, formal safety directives should be instituted with more subtle approaches aimed at promoting caring on the part of soldiers and the unit in terms of concern for the personal outcome of dealing with risks, and also for the effects of their activities upon other people.

Rules and Regulations

The specific norms and rules governing safety within the unit will also be at the heart of a safety culture. As guidelines for action, these will shape the perceptions and actions of your soldiers in particular ways, defining what is and is not to be regarded as a significant risk, and what represent appropriate responses to such risks. In an ideal world one might attempt to specify a set of complete, up to date, and practical contingencies that anticipate all foreseeable risks and hazards. However, there is always stress between the need to handle both hazards that are well defined in advance, and those that are ill-defined or unexpected, perhaps because they arise only infrequently in periods of crisis or because they are completely beyond the boundary of current operational experience. Being alert to both well-defined and ill-defined or unseen hazards is a demanding task, since the application of existing rules and Standard Operating Procedures to guard against anticipated hazards might lead to crucial oversights. Guarding against this involves a willingness to monitor ongoing practices in many ways; to accept uncertainty and the unknown as facts of life; to exercise creativity and safety imagination as aids in assessing risks and hazards; and to be prepared both to listen to opinions about risk from all soldiers, as well as to reward rather than ignore or punish those who point out safety deficiencies.

Ongoing Reflection

The final requirement for the development of a safety culture is ongoing reflection about current practices and beliefs. This involves the search for meaning and new knowledge in the face of initial ambiguity and uncertainty about what may prove to be a significant risk or hazard. This process is crucial if a unit is to learn, as well as adapt to changing circumstances. As noted earlier, one function of reflection is to guard against the over-rigid application of existing safety rules, regulations, and procedures. This reflection is most effective when used by both reactive accident investigations, together with proactive incident reporting and feedback. Such open communication links between the leadership and soldiers have been found to be associated with safe organizational climates. This is fostered where units actively avoid laying blame for mistakes and errors. This latter consideration sets special responsibilities, once again, on the leadership for setting the framework within which safety can gain suitable priority.

Conclusion

It will be no simple matter to translate these concepts into practical action. The Army is notoriously resistant to change, and there is no reason to believe it will react any different in this respect to the concepts of safety culture. Any permanent change will be best addressed through long-term organizational learning on the part of every commander, officer, non-commissioned officer and enlisted soldier in the Army.

It must be emphasized that safety culture cannot be considered a cure-all to prevent accidents in the face of more pressing issues that undermine safety such as poor infrastructure

Being alert to both well-defined and ill-defined or unseen hazards is a demanding task

or lack of resources and personnel. Senior Army leadership is aware of these threats to readiness. Yet, they are also aware of the serious consequences (both direct, such as deaths and injuries, and indirect, such as loss of resources and mission capability) that accompany poor safety. At the Safety Center we are launching several initiatives to address their concerns and improve safety. In order for these initiatives to be effective, every soldier at every level within the Army must support them. Your emphasis on safety and the establishment of a safety culture within your command is key; leaders' involvement saves lives.

—adapted from Pidgeon and O'Leary (1994). *Organizational Safety Culture.* Hants, UK: Ashgate.

—CPT(P) Robert M Wildzunas, Ph.D., Command Psychologist, US Army Safety Center, DSN 558-2477, 334-255-2477, wildzunr@safety-emh1.army.mil

Luckily, They Didn't Use Risk Management

Lest we forget the lessons

A dramatic and violent battle raged in the skies over Great Britain during the summer of 1940. Field Marshall Göring promised Hitler that the Luftwaffe could and would make quick work of the Royal Air Force, as the forerunner to Operation Sea Lion, the German invasion of the British Islands. Why couldn't they? Success belonged to the Luftwaffe and their tactics known as Blitzkrieg, the first fully modern combined arms warfare. In a matter of months, they had conquered all of Western Europe, handing defeat after crippling defeat to the allies.

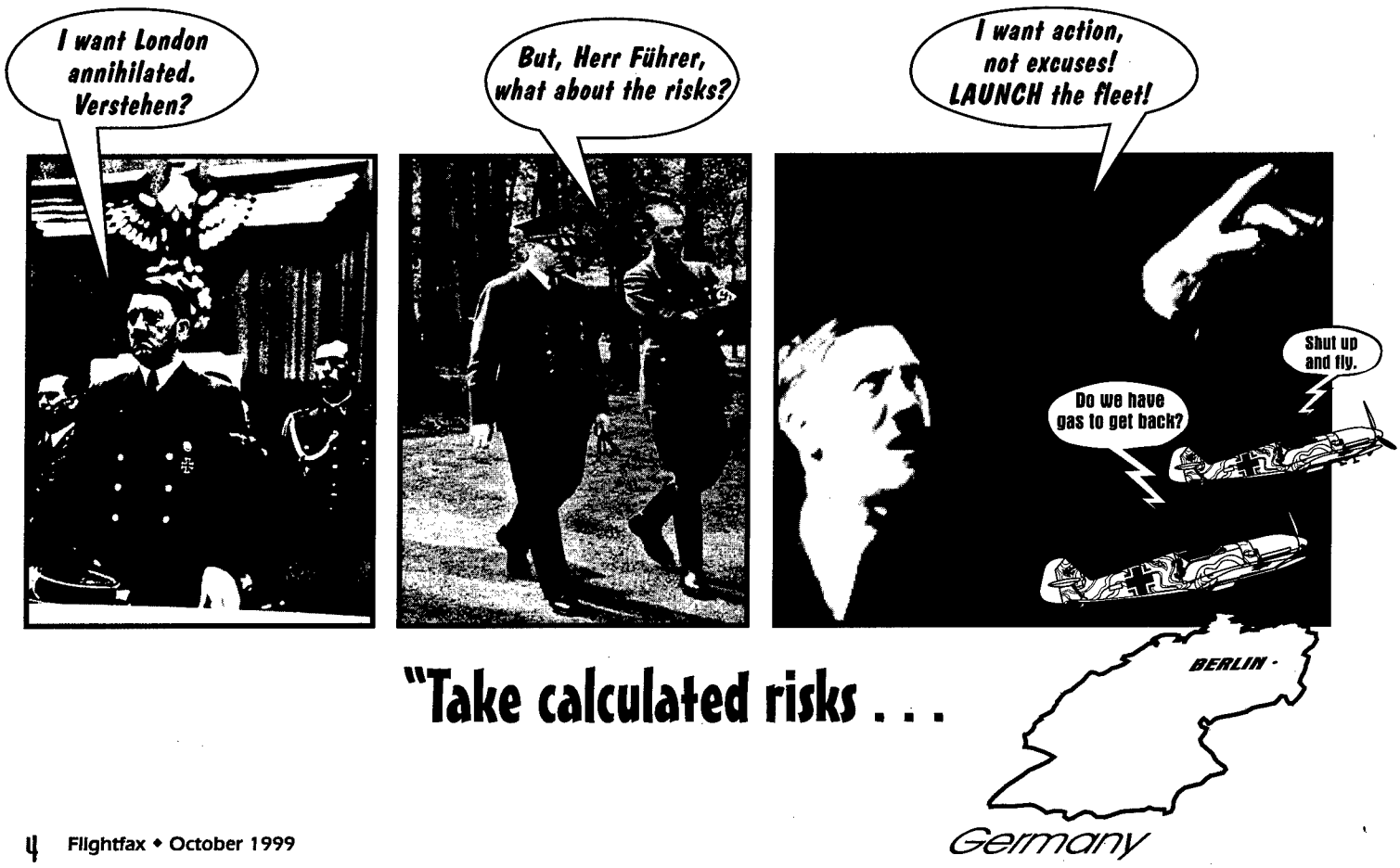
The Luftwaffe was at its peak in proficiency. They were combat experienced, confident, and battle hardened. They had flight time, training, and field leadership. They outnumbered the British by more than two to one.

Historians and scholars argue about the reasons why the Luftwaffe eventually failed at gaining and maintaining air superiority during those crucial months, but it is certain that the highest German leadership made several critical mistakes at a time when mistakes were unacceptable. They failed to recognize the newly developed technology that radar offered the RAF as a force multiplier. The British, using radar, were able to mass their very limited fighter resources in the right times and places, intercepting, attacking, and disrupting the huge German bomber formations.

Although the Germans initially went after the RAF fighter bases, attacking their aircraft and support facilities on the ground, Hitler ordered a shift in policy. After a German bomber formation accidentally bombed London, RAF bombers retaliated against Berlin, something Hermann Göring promised would never happen. Absolutely furious, Hitler ordered London bombed off the face of the earth, giving invaluable recovery time to the RAF fighter squadrons.

Having limited range, the German fighters were unable to escort their bomber formations to the targets. Had they utilized drop tanks, the bombers would have taken far fewer losses. In essence, the Luftwaffe faced the same problems as the Army Air Corps faced in the latter stages of the war.

However, in wartime, mistakes do happen, and the German High Command leadership made their share. Still, the Germans came incredibly close to winning the Battle for Britain. With their superiority in sheer aircraft



"Take calculated risks . . .

numbers, the Germans could have easily defeated the British, despite mistake-ridden, High Command decisions. The slight difference could have been made with the concept of risk management.

Wartime accident losses are usually preventable and reduce your ability to complete the mission. It is even more true today than then. Although no statistics are available on exact losses due to accidents, it is fair to assume that at least 50 percent of the 1655 German aircraft lost were due to accidents. This rate has remained somewhat steady over history for the United States, ranging from 56 percent in WWII, to 44 percent in Korea, to 54 percent in Vietnam. In Desert Storm, accident losses went to 75 percent of the total US casualties (USASC files).

Given the extreme conditions of the extended ranges, poor weather conditions, field maintenance, flight discipline, and rushed training, it is conceivable that a 50 percent loss rate due to accidents is quite realistic for the German forces. Imagine if the basic German leadership had used the principles of risk management. Imagine if they had identified and controlled, to the best of their ability, hazards to protect their force. A reduction of perhaps five to ten percent might have made the difference in the numbers, allowing the Luftwaffe to deplete the severely limited RAF fighter pilot reserves and gain air superiority.

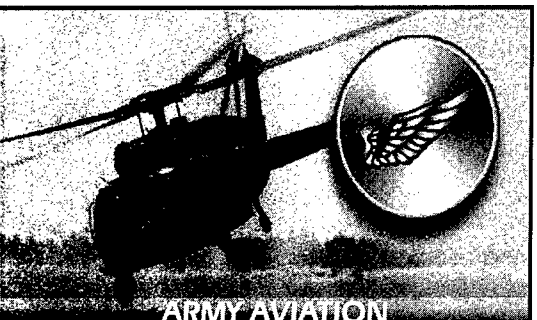
The risk-management process is not rocket science. The simple steps, when incorporated into every activity, reduce the risks to an acceptable minimum. The steps are (1) identify hazards, (2) assess hazards, (3) develop control measures and make risk decisions, (4) implement controls, and (5) supervise and evaluate. Using this process, the Germans could have effectively reduced maintenance errors, weather-related accidents, crew-mix-related accidents, crew coordination problems, and training-related accidents. Indeed, the very switch in tactics from Blitzkrieg to massing aircraft to obtain air superiority likely caused battlefield confusion and probably was not taken into account as a potential hazard.

Remember the fine line between victory and defeat is sometimes measured in small numbers. Even a slight reduction in the German accident rate could have made the difference then. It is important that we do not forget the lessons of the past and incorporate our safety doctrine and risk management techniques into all operations, peacetime and wartime.

—LTC Mark Robinson, Chief,
Attack Branch, US Army Safety Center,
DSN 558-1253, (334) 255-1253,
E-mail: robinsom@safety-emh1.army.mil

. . . That is quite different from being rash."

—General George S. Patton, Jr.



ARMY AVIATION
BROKEN WING AWARD

BROKEN WING

The Army Aviation Broken Wing Award recognizes aircrewmembers who demonstrate a high degree of professional skill while recovering an aircraft from an inflight failure or malfunction requiring an emergency landing. Requirements for the award are in AR 672-74: Army Accident Prevention Awards.

Making The Near-Impossible Happen!

The Broken Wing Award is awarded to CW4 Thomas Panza (PC) of the 3-7 Cavalry, Fort Stewart, GA, for exceptional flying skill in the face of extreme adversity. *Congratulations!*

The OH-58D(I) was at 1700 ft MSL and 55 KIAS when CW4 Panza lowered the collective to perform the autorotational RPM check during his MTF. The Nr and Np were within normal limits, so CW4 Panza reduced the throttle to the idle stop. He cross-checked his instruments and saw the Ng stabilize at 63.2 percent. Approximately 3 seconds later at 1250 ft. MSL, the engine went below 63 percent Ng. CW4 Panza rolled the throttle back on, but the engine did not respond.

At 1000 ft MSL the engine-out warning illuminated on the MFD as Ng decelerated below 41 percent. CW4 Panza continued his autorotational descent, cross-checked his instruments to maintain a steady autorotational profile, made a MAYDAY call to Wright Tower, and executed a autorotational landing with only minor damage to the aircraft.

CW4 Panza skillfully maneuvered the helicopter to avoid standing dead trees, large bushes, ruts in the ground that were over 2 feet deep, and cut logs that were lying across the ground. He also realized that the extremely wet conditions of the landing area necessitated a zero ground run autorotational landing. Given the poor autorotational characteristics of the OH58D(I) and the lack of training on zero ground-run autorotational landings, CW4 Panza made the near-imppossible happen due to his excellent flying skills. The elapsed time from onset of emergency to termination was 20 seconds.

5500 ft Is A Long Way To Drop!

The Broken Wing Award is awarded to CW3 Ronald L. Peterson (PC) and CW3 Roger A. Merrill (PI) of the NGB Army Aviation Support Facility, St. Paul, MN, for exceptional flying skill and crew coordination in the face of extreme adversity. Congratulations!

The crew departed Minneapolis at approximately 0800 in an AH-1F. Approximately 1.5 hours into the flight, after a long period of level cruise at 5500 feet, a series of three sharp reports were heard coming from the engine area. The engine RPM fluctuated, and CW3 Peterson confirmed the emergency with the instruments. The master caution light and engine oil pressure light illuminated, and the oil pressure gauge read zero. CW3 Peterson directed the PI to transmit a MAYDAY call and to lock shoulder harnesses while he assumed an autorotational profile and placed the transponder to emergency.

The engine continued to stall until the throttle was reduced to flight idle. After the aircraft was in a proper autorotational state and the crew had confirmed their landing spot , CW3 Peterson tried to increase throttle to see if power could be restored for the landing. The engine immediately experienced continuous compressor stalls, so CW3 Peterson returned the throttle to flight idle and refocused his efforts on the landing plan. At approximately 2500 feet altitude and 80 knots airspeed, the engine failed completely.

The aircraft was aligned on a modified base for landing into an open field. At approximately 500 feet AGL and 80 knots IAS, CW3 Merrill confirmed the landing zone, but then noticed wires paralleling the road and questioned whether they would be able to avoid the wires. CW3 Peterson agreed and selected an adjacent open field. Again, CW3 Merrill was able to make out wires that crossed this field also. CW3 Peterson agreed with CW3 Merill's assessment and selected a third open field.

CW3 Peterson made the correcting turns to align the aircraft and entered a steep deceleration profile to deplete airspeed prior to touchdown. Upon feeling the airspeed diminish and the aircraft beginning to settle, CW3 Peterson leveled the aircraft and applied full collective to arrest the descent. The aircraft landed level, skidded approximately 10 feet, and rocked forward slightly on the skid shoes before coming to a complete stop. Within 20 seconds, the rotor

stopped. The elapsed time from onset of the emergency to termination was 5 minutes.

That Crew Coordination Stuff Really Does Work!

The Broken Wing Award is awarded to CW3 Michael J. Knuppel (PC) & CW2 Joseph P. Zewiske, (PI) of the 832nd Medical Co (Air Ambulance), West Bend, WI, for averting disaster with excellent crew coordination and situational awareness. *Congratulations!*

During a day, VFR NOE training flight in a UH-1V, the PC entered a descending right turn from 300 ft AGL in order to resume NOE flight. At approximately 160 ft AGL (100 ft AHO), the crew heard a loud pop from the engine area. Immediately, the aircraft experienced a left yaw, a decrease in engine and rotor RPM, illumination of the RPM warning light, and the sounding of the RPM audio. The PC was on the controls and immediately lowered the collective to try and regain RPM. He turned the aircraft parallel to the hill, toward an old tank trail that was surrounded with trees, and made a MAYDAY call on tower frequency.

During the descent the PI focused on his area of responsibility, without direction, and noticed the RPM was decreasing below 5900 RPM (more than 10% below normal). He announced to the PC that he was placing the GOV switch in the emergency position, which occurred at approximately 20 ft above the trees. The engine RPM immediately increased to 6700, and the PI announced and took manual control of the throttle to maintain RPM within limits. The PI then announced that the engine and rotor RPM were within limits and, in conjunction with the PC, immediately increased collective to stop the descent into the trees.

The PC then decided to turn right, toward a nearby military drop zone that offered a better area for landing. During this time, the PI placed the transponder to emergency, made numerous MAYDAY calls and continued to monitor throttle application. Arriving at the drop zone, the PC made a left turn to align the aircraft with the rolling terrain and announced that he was performing a running landing. The aircraft was landed with no damage and shutdown without any further incidents. The elapsed time from the onset of the emergency to the landing was approximately 45 seconds.

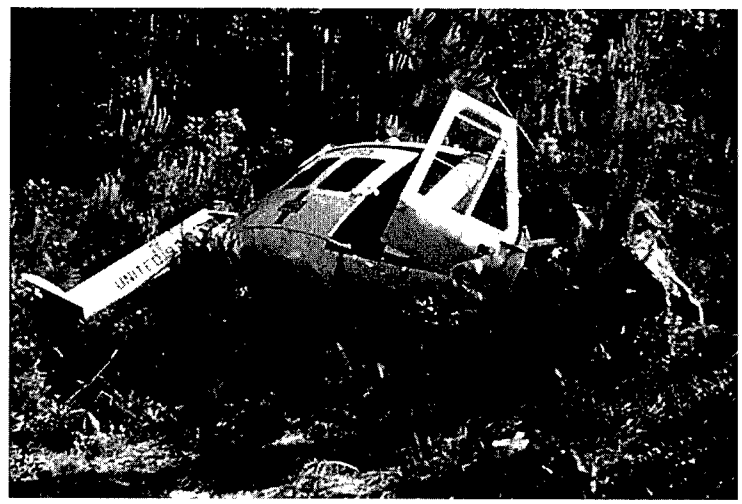
Never Stop Flying, No Matter How Many Parts Fall Off!

The Broken Wing Award is awarded to DAC Joe J. Hudgens, Jr. (PC) & CW4 Francis M. Crawford (PI) of the US Army Aeromedical Center, Fort Rucker, AL, for exceptional crew coordination and flying skill in the face of extreme adversity. *Congratulations!*

After dropping off a MAST (Military Assistance to Safety and Traffic) patient in Birmingham, AL, the UH-1V and crew were heading back to Cairns Army airfield. The aircraft was in straight-and-level flight flying at 90 knots and 2500'. The crew heard a loud bang, then the aircraft violently yawed to the right and pitched nose down 40 degrees. At this point both pilots realized that they had, at least, lost tail rotor control. Due to the fatigue in the tail spar, the aircraft lost 100.6 lbs. of vertical fin and tail rotor, causing a rapid shift in CG and a violent right yaw.

CW4 Crawford initially lowered the collective, but this only increased the aircraft's nose-low attitude. CW4 Crawford then raised the collective slowly trying to arrest the nose-low attitude. DAC Hudgens then came on the controls with CW4 Crawford because he knew that more than one pilot would be required to fly the aircraft. With both pilots manipulating the controls, they directed the crew to send out a MAYDAY call, alleviated the rapid descent without rapid aft cyclic, and gained control of the aircraft.

Knowing that they had limited control and stability, the crew located the only area suitable for a crash landing, a small field with short trees to the right of the aircraft. With both pilots utilizing unparalleled crew coordination, DAC Hudgens and CW4 Crawford managed to guide the aircraft in a right hand, semi-circular pattern to make the landing area. Once the crew was assured that the landing area



could be reached, they began their final descent.

While CW4 Crawford was slowing the forward momentum of the aircraft with the use of the cyclic and collective, DAC Hudgens was controlling the yaw by adjusting the throttle. When the aircraft was approximately 5 ft above the trees and at approximately zero airspeed, DAC Hudgens brought the throttle to idle to arrest the yaw rate of the aircraft. Both pilots began to increase collective to cushion the aircraft's impact into the landing site. The aircraft impacted the ground with the nose of the aircraft slightly to the right. Both pilots and one crewmember suffered severe injuries and the other crewmember was only slightly hurt. The elapsed time from the onset of the emergency to termination was approximately 20 seconds.

Can You Fly The Unflyable?

The Broken Wing Award is awarded to CW3 Paul A. Pederson (PC) and WO1 James K. Soltani (PI) of the 3rd Squadron, 4th Cavalry, Fort Hood, TX, for exceptional flying skill and crew coordination in the face of extreme adversity. *Congratulations!*

The OH-58D(I) crew had just completed refueling the aircraft at a field FARP following an NVG training mission. The PI was on the controls at 150 feet AGL and 40 knots when the aircraft developed severe lateral and vertical vibrations as a result of a tailrotor counterweight bracket failing. The PC got on the controls with the PI and initiated an approach without delay.

Immediately, the aircraft was vibrating so violently that the crew was unable to communicate through the aircraft intercom system or read the flight instruments. To make matters worse, the Pitch/Roll SCAS disengaged during the descent, adding to the already impossible task of flying this aircraft. The flight recorder data show that the crew battled erratic pitch, roll, and yaw rates on the order of +45 to –43 degrees for pitch, +24 to –24 degrees for roll, and +23 to –19 degrees for yaw. The vibrations were so intense that the aircraft's position lights were blown out.

Both crewmembers showed great skill in recognizing the severity of the situation. While both crewmembers were on the controls, and without the aide of SCAS, they were able to safely land the aircraft without further incident. After shutdown it was noted that the 90-degree gearbox had two bolts holding the gearbox to the tailboom. The remaining bolts had been stretched to the point where the entire gearbox could be lifted off the tailboom mounting point. The entire drive train from the engine back had to be replaced. The engine was loose at the forward mounting points where the engine mounts to the airframe, and it was replaced due to the compressor rubbing on the compressor housing. The elapsed time from onset of the emergency to termination was 25-30 seconds.

Text-Book Maneuvers By Remarkable Pilot!

The Broken Wing Award is awarded to CW2 John A. Cappadaro (PC) of the 1st US Support Battalion, South Camp, Sinai, Egypt, for exceptional decision making and flying skill in the face of extreme adversity. *Congratulations!*

During takeoff of a transport mission, the master caution light in his UH-1H illuminated. Subsequently, the engine chip and engine oil pressure lights illuminated. CW2 Cappadoro announced the emergency and described the indications of the emergency to the PI, who was on the controls. CW2 Cappadoro practiced excellent crew coordination by allowing the PI to maintain aircraft control while he began evaluating the surroundings for a possible forced-landing area.

As the PI began a left turn toward the most suitable area and away from buildings and wire hazards, the engine began to overspeed. CW2 Cappadora immediately announced an overspeed condition and increased collective to load the rotor system. Both engine and rotor RPM were maintained within normal, safe operating limits by CW2 Cappadoro's quick identification and corrective actions.

CW2 Cappadora assumed control of the aircraft and reduced the throttle in an attempt to maintain aircraft control and keep engine RPM within limits. When the throttle was reduced, the engine RPM began to fluctuate severely. He directed the PI to place the governor switch into the emergency position and prepare for a possible forced landing. CW2 Cappadora was maneuvering the aircraft into the wind, away from wires and several other structures when the engine finally failed.

CW2 Cappadora announced the failure and placed the aircraft into an autorotational profile. The aircraft touched down in a semi-level attitude with minimal ground run. Although the aircrew initiated the autorotation at 70 ft AGL and 30 knots when the engine failed, the aircraft was not damaged and no injuries were sustained by the crew or by the six passengers. The elapsed time from onset of the emergency to termination was 30 seconds.

3 Out of 4 Wheels Isn't Good.

The Broken Wing Award is awarded to CW4 Timothy K. Welsh (PC) of the 7th Battalion, 101st Aviation Regiment, Fort Campbell, KY, for exceptional decision making and situational awareness in the face of adversity. *Congratulations!*

CW4 Welsh was returning his CH-47D to the tactical assembly area after completion of an NVG Brigade Air Assault operation. The aircraft was transporting the maintenance recovery team, which consisted of an internally loaded HMMWV and six maintenance personnel. The aircraft was landing to the desert floor (3200 ft MSL), under NVGs, in brownout conditions at the time of the emergency.

CW4 Welsh was on the controls, and occupying the right-side pilot seat. As the aft landing gear touched down, the aircraft suddenly rolled to the right, so violently that CW4 Welsh's flight helmet struck the right-side window. CW4 Welsh applied immediate left cyclic, and as the aircraft rolled level, he pulled in maximum thrust to get the aircraft airborne. By this time, the master caution and utility system failure lights had illuminated.

After clearing the brownout conditions, the aircraft was stabilized at a 250 ft OGE hover to check systems. The flight engineer (FE) confirmed that utility system pressure was at 0 psi. Due to the existing brownout conditions, CW4 Welsh elected to recover the aircraft to nearby Bicycle Lake AAF. The airspeed was kept to 40-50 knots IAS, due to excessive vibrations caused by the damaged landing gear.

The PI coordinated with ground personnel to construct a landing platform to support the right, aft portion of the aircraft. The platform was necessary because the landing gear had fallen off during the flight to Bicycle Lake AAF. After the aircraft landed, CW4 Welsh ordered the passengers to exit the aircraft through the cabin door. No other damage or injuries occurred. The elapsed time from the onset of the emergency to termination was approximately 1.5 hours.

Get That Drogue Away From Me!

The Broken Wing Award is awarded to CW2 Ryan M. Sarvie (PC) of the 10th Avn Regt, Fort Drum, NY, for exceptional decision making and flying skill in the face of extreme adversity. *Congratulations!*

CW2 Sarvie was on the controls of the trail UH-60L in a flight of seven that was landing to an LZ under NVG conditions. While on short final over uneven and rutted terrain, CW2 Sarvie heard a loud bang from the rear of the aircraft and felt the aircraft violently shudder. Unknown to CW2 Sarvie, a drogue chute and parachute pack had become entangled in the tail rotor of his aircraft, causing the tail rotor gearbox to be torn from the aircraft and a fire to ignite in the tail rotor gearbox area. They had been left in tall grass and brush near the approach end of the LZ after a parachute operation.

The aircraft immediately yawed hard right, pitched forward, and rolled left. Recognizing that the aircraft was not in a condition for sustained or controlled flight and that Chalk 6 was in close proximity, CW2 Sarvie took immediate action to attain a level and survivable landing attitude. Left pedal inputs had no effect on the yaw, and there was no time to reach up and retard the power control levers. He controlled the spin by immediately lowering the collective and simultaneously applying hard right and aft cyclic to arrest the left rolling and forward pitching motion.

Moments later, while still slightly left-side low and spinning to the right, CW2 Sarvie successfully landed the aircraft in a near-level attitude a safe distance from the rest of the flight. The aircraft landed hard, but damage was minimized by a proper landing attitude.

Once on the ground, the aircraft spun another 30 to 40 degrees, but CW2 Sarvie continued to fly the aircraft and was able to keep it upright. Upon seeing that the aircraft may be on fire, CW2 Sarvie determined that the turning main rotor blades were stable, so he ordered the immediate evacuation of the aircraft. The elapsed time from onset of emergency to termination was one minute.

—Adapted from the Broken Wing Award nomination packets. Refer questions to the editor. DSN 558-9853, (334) 255-9853, E-mail: flightfax@safety-emh1.army.mil

Accident briefs

Information based on *preliminary* reports of aircraft accidents

AH64

Class C

A series

■ The aircraft was being MOC'ed for tail rotor assembly maintenance when the FM antenna separated from the upper tail pylon and contacted the tail rotor assembly. Stabilator sustained sheet metal damage. Tail rotor blade and whip antenna required replacement.

D series

■ The aircraft tail rotor contacted power lines while on a training flight with a British exchange pilot onboard. Aircraft landed and damage was found on one tail rotor blade and the FM whip antenna.

Class D

A series

■ During test flight for an unrelated maintenance action, a zeus fastener on the 90-degree gear box cover detached from the helicopter. The fastener struck a tail rotor blade and fragmented. The resulting shrapnel punched two holes in the top of the horizontal stabilator. The leading edge of one tail rotor blade was damaged.

CH47

Class C

D Series

■ During slingload training with 18000 lbs block, at a hover, the crew heard a loud bang from the back of aircraft. Crewchief stated that sling leg had broke and crew landed aircraft without further incident. After returning to airfield crew found sheet metal damage around center cargo hook area.

■ During engine run-up for a hydraulic MTF, the FE reported to the IP that he had located a droop stop lying on the ground. Maintenance personnel were immediately notified and wood and mattress shoring was emplaced to protect the aircraft fuselage against contact by the rotor blades during shutdown. During final rotation, the aft yellow blade contacted one of the wood beams, causing it to strike and rip away a portion of the upper fuselage.

■ Cargo door portion of the ramp was discovered missing during postflight inspection. Suspect cargo door fell off during flight, but crew didn't know when it might have happened. Another cargo door was installed.

Class D

D series

■ During a two-wheel back taxi out of hot refuel, the aft right gear turned perpendicular to the direction of travel and broke off. The crew had locked the swivels and rolled forward to ensure they were locked, but they did not visually check. Landing gear was replaced.

■ During maintenance test flight, left side "eyebrow" above copilot seat cracked and flew off aircraft.

OH6

Class A

J series

■ Aircraft landed hard after flight test maneuver. The flight maneuver exceeded aircraft performance parameters. Extensive damage was reported. Contract pilot was able to egress and sustained only minor injuries.

OH58

Class B

D Series

■ Crew experienced loss of tail rotor authority during flight and initiated an emergency landing to a pinnacle. Aircraft sustained damage to main rotor blades, tail boom, nose, and landing gear upon landing.

Class C

C Series

■ Crew was performing a power check from a 60-foot hover when aircraft yawed slightly, followed by an engine surge. Surge and yaw continued to increase as PC assumed controls. PC executed autorototation, and aircraft touched down hard on uneven terrain.

D Series

■ On takeoff, crew experienced a series of loud reports and an uncommanded right spin. IP initiated an autorotation and aircraft came to rest upright. Crew reported overtorque of the engine (reading of 169% for 1 second) and damage to the rear landing gear mount.

■ Crew reported power surge during an approach to land, at approx. 4 feet AGL. Aircraft landed hard, and the engine was pulled for replacement. Subsequent inspection revealed additional damage to other components (drive train, flex coupling).

■ Crew experienced dust during an approach to land at an LZ. Skids descended into soft ground/dirt on touchdown, and aircraft rocked forward, contacting the WSPS to the ground. Postflight inspection revealed damage to WSPS, skids (spread), and sheet metal.

■ While aircraft was still positioned on the ground and at 100% Nr, engine Np peaked at 125% for 4 seconds. Pilot on the controls had just switched the FADEC from the "auto" to the "manual" position.

■ Aircraft tail rotor contacted a tree while at a hover during live fire, "stinger" operations. Aircraft was landed without further incident.

■ Aircraft engine temperature peaked at 1032°C for one second during start up.

Class D

C Series

■ During touchdown on standard autorotation, aircraft touched down tail low and nose high. Aircraft rocked forward, became airborne again, and landed hard.

UH1

Class B

H Series

■ Aircraft drifted rearward into another parked aircraft during an extended hover operation.

UH60

Class A

A Series

■ Aircraft was Chalk 2 in a flight of two, flying in an extended formation. PC initiated steep turn during contour flight and lost altitude. Aircraft was slow to recover from such a steep turn, and incidentally, flew through the trees, causing extensive damage to aircraft. PC landed the aircraft in small opening with no further incidents. No injuries reported, but extensive structural damage occurred.

Class B

A Series

■ Aircraft was at a high hover when it reportedly experienced settling with power. Aircraft rapidly descended to ground impact, became airborne again after bouncing, and then landed with no further incident. Amongst the damage, the tail landing gear collapsed and right cockpit door separated.

Class C

A Series

■ During engine start, crew noticed that one of the main rotor blade tie-downs was still attached so an emergency engine shutdown was performed. Inspection revealed that the tie-down damaged the T/R blades and aft antenna.

■ During air assault demo rehearsal, the stabilator contacted the ground during landing. The aircraft had an excessive nose-high attitude on touchdown. Landing area was a generally flat grass area between taxiways.

■ Aircraft was making a downwind landing into a tactical assembly area with a 20 knot tail wind. A "roll-on" landing was being executed, but vibrations from ETL transitioning mounted and the aircraft hit hard. The rear strut on tail wheel assembly was destroyed. The tailboom and some fluid lines may also be damaged.

■ Crew reported loss of Nr(RPM) during simulated engine-out procedure. Crew initiated emergency landing procedures. Aircraft sustained stabilator and under-carriage damage after a hard landing.

L series

■ Aircraft's main rotor system contacted tree branches during taxi from parking to the FARP site for a FARP fire drill. Three tip caps were damaged, two of which were destroyed and required replacement.

■ Aircraft was on final approach to LZ, where tail and the stabilator were damaged during deceleration prior to landing.

■ Main rotor blade tip caps contacted a light pole while aircraft was taxiing to refuel.

A-series (MH-60)

■ Cargo door window separated in flight and contacted one main rotor blade. Blade replacement required.

K-series (MH-60)

■ Flight consisted of night, fastrope training for crewchiefs while under NVGs. Aircraft had completed one iteration/approach to an elevated platform and was on the second approach when the tail wheel made contact with the platform. Aircraft was landed without further incident. The tail wheel was found pushed up into the tailboom.

Class D

A series

■ Upon completion of MEDEVAC mission, the left APU door was found missing during postflight. The departing door struck the stabilator and damaged it. Inspection of aircraft revealed structural failure of the APU door hinges.

L series

■ Crew was flying an NVG troop insertion mission, at approximately 100 ft AGL and 90 knots. Crew was descending from a ridgeline into a valley when aircraft struck three power lines, cutting through them. The power lines were at 50 ft. AGL. Crew landed aircraft without further damage. Postflight inspection revealed damage to aft (bottom) cabin area and to tail wheel.

■ PC attempted to hook up a M119 with the gun barrel facing aft in a field of 7-foot-tall grass. After 2-3 min. of trying to hook up the load, the crew backed off the load and the PI attempted it. After the PI hovered over the load for another 2-3 minutes, the crewchief called load strike when the aircraft descended on to the load. No damage occurred to the M119, but aircraft received damage in the tail cone section.

C12

Class C

R series

■ Aircraft was struck by lightning at 17,000 ft MSL. Lightning struck the right propeller and exited at the right inboard edge of the landing flap. A static wick was also blown off during strike. Onboard weather scope showed there was 15 miles of lateral separation from clouds at time of strike. Aircraft was landed without further incident.

■ Aircraft was struck by lightning during initial portion of flight and recovered to home station without further incident. Crew had been briefed of isolated thunderstorms during weather briefing, but weather radar indicated no weather hazards in the vicinity.

Class D

F series

■ After being refueled, aircraft began taxiing and struck a 3-foot ladder that was used for refueling. One of the three blades on the left propeller was damaged.

Class E

F Series

■ Engine shutdown in flight during training, while at cruise altitude. Four attempts to restart the engine failed. Aircraft was flown back to home field approximately 10 minutes away without further incident.

■ Number 2 engine would not produce minimum takeoff power under the conditions for the day. Maintenance personnel removed corrosion from the P2 cannon plug, and the aircraft checked out OK.

O5

Class A

■ Aircraft was reported missing during a service/surveillance mission. Wreckage was located and identified in a remote, mountainous, and heavily forested region. Aircraft impacted the side of a mountain during VMC, night conditions. Seven fatalities.

For more information on selected accident briefs, call DSN 558-9853 (334-255-9853). Note: Information published in this section is based on *preliminary* mishap reports submitted by units and is subject to change.

Aviation messages
Quarterly list update - Have you read these?

Aviation safety-action messages

June 99

AH-64-99-ASAM-07: Tail Rotor Head Assembly
UH-60-99-ASAM-08: Bellcrank Support Assembly Inspection

July 99

UH-60-99-ASAM-09: M/R Blade Expandable Pin Inspection
UH-60-99-ASAM-10: Crossfeed Breakaway Valve Inspection

August 99

AH-64-99-ASAM-08: Inspect T700-GE-700/701/701C Engines
UH-60-99-ASAM-11: Inspect T700-GE-700/701/701C Engines
UH-60-99-ASAM-12: Inspect Hamilton Standard HMU's
UH-1-99-ASAM-03: Inspection of Fuel Quantity Transmitter
OH-58-99-ASAM-08: Mast Torque Transient Limit Change

Safety-of-flight messages

June 99

AH-1-99-04: Mandatory N2 Spur Gear Replacement
CH-47-99-01: Synchronized Shaft Mounting Brackets

July 99

OH-58-99-02: Replace Main Fuel Controls

August 99

CH-47-99-02: Immediate Grounding due to Planetary Gear
AH-64-99-03: Remove APU
CH-47-99-03: Forward/Aft Transmission Gear/Bearing Assembly
CH-47-99-04: Inspection of Forward/Aft Gear/Bearing Assemblies

September 99

CH-47-99-05: Replace Forward/Aft Transmission Assemblies

Don't Have One of These? Log-on to the Risk Management Information System (http://rmis.army.mil). Your ASO or commander should have a password.

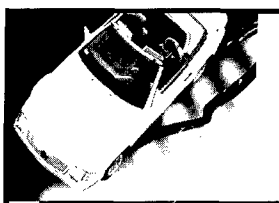
Shortfax
Keeping you up to date

Looking For Answers?

Last month, in the September issue of Flightfax, a Power Management Jumble puzzle appeared. There was a printing error in question number 8. The jumbled word contained an extra "T", and no "Y" to make the word, "compressibility". Our apologies for the error. Additionally, the answers to the rest of the puzzle appear below in case you had difficulty.

Answers: 1. Eliminate 2. Physical, Weather 3. Resultant 4. Angle of Attack 5. Ninety 6. Twenty 7. Diameter 8. Compressibility 9. Retreating Blade Stall 10. RPM 11. Settling With Power 12. Downwash 13. Airspeed 14. Sixty 15. Risk Assessment Sheet

Answer to Jumble:
What is the high risk portion of my low risk mission I'm about to do?



POV Fatalities
through 30 Aug

FY99	FY98	3-yr Avg
116	107	104

TOP 3 KILLERS
1. Speed 2. No seatbelts 3. Fatigue
TREND: Motorcycle accidents on the rise

IN THIS ISSUE

UIS • War Stories, CC • Crew Commo, SF • Shortfax

FY99 Aviation Accidents through 30 August

		Class A	Class B	Class C	Total
ACCIDENTS	Total Avn Acdts	18	9	82	109
	Flight Acdt Rate	2.20	0.98	7.81	10.98
RATE COMPARISON	FY99 vs. FY98	49 %	50 %	0.2 %	13 %
	FY99 vs. 3-yr avg	90 %	31 %	13 %	25 %
	Aviation Military Fatalities				20

U.S. ARMY SAFETY CENTER

Flightfax is published by the U.S. Army Safety Center, Fort Rucker, AL 36362-5363. Information is for accident-prevention purposes only and is specifically prohibited for use for punitive purposes or matters of liability, litigation, or competition. Address questions about content to DSN 558-2676 (334-255-2676). Address questions about distribution to DSN 558-2062 (334-255-2062). To submit information for publication, use fax 334-255-9528 (Attn: Flightfax) or e-mail flightfax@safety-emh1.army.mil Visit our website at http://safety.army.mil

Gene M. LaCoste
Brigadier General, USA
Commanding